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A STUDY TO ASSESS ASSOCIATION OF METABOLIC SYNDROME IN PSORIASIS PATIENTS

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INTRODUCTION

Psoriasis is a common, chronic, disfiguring, inflammatory and proliferative condition of the skin, in which both genetic and environmental influences have a critical role. The most characteristic lesions consist of erythmatous, scaly well demarcated, indurated plaques; present particularly over extensor surfaces and scalp.[1]

The disease is enormously variable in duration, periodicity of flares and extent. Scales exacerbate on scraping with a glass slide which is known as Grattage test. Further scraping reveals a thin shiny membrane known as membrane of Berkeley, removal of which leads to punctate bleeding points called as Auspitz sign.[1]

The morphological variant of psoriasis include plaque are, inverse, pustular, guttate, erythrodermic, unstable psoriasis.

Common nail changes in psoriasis are thimble pits, subungual hyperkeratosis and onycholysis.

Psoriasis is ubiquitous in distribution with prevalence varying from 1.5 to 3% in Caucasians population, although prevalence as high as 4.8% has been reported.[2]

The incidence is equal in male and female. However age of onset is younger in females, peak age of onset in males and females is 22 and 16 years respectively.[3]

The metabolic syndrome is a combination of diabetes mellitus type 2, hypertension, central obesity and combined hyperlipidemia.[4] The present study is conducted to find out and compare the proportion of metabolic syndrome in patients with and without psoriasis, to determine the association of metabolic syndrome in psoriasis patient, to know the risk of metabolic syndrome in psoriasis patient and to study the clinical and biochemical profile of metabolic syndrome in patients with and without psoriasis.

MATERIAL AND METHODS

A Hospital based case-control study involving 123 patients of clinically and histologically proven psoriasis (Group A) and an equal number of age and sex matched controls (Group B) attending dermatology Out Patient Department for treatment of other diseases.

Inclusion Criteria For Cases

- Patients of age > 18 years and < 60 years
- Confirm case of psoriasis
- Duration of psoriasis at least 1 months
- Patients willing to participate in the proposed study

Exclusion Criteria For Cases

- Patients on systemic therapies for psoriasis last 1 month that are known to interfere with metabolism (methotrexate, Retinoids, Corticosteroid, cyclosporine A, immunotherapy, biological therapy, Psoralines and phototherapy).
- Patients previously taken any other drugs that is known to disturb metabolism
- Pregnant and lactating women.

Inclusion Criteria For Controls

- Dermatitis patients attending at Dermatology OPD without psoriasis.
- Patient willing to participate in the proposed study.

Exclusion Criteria For Controls

- Patients taking any drug that is known to disturb metabolism.
- Seriously ill patients.
- Pregnant and lactating women

A written informed consent was taken from all patients fulfilling the inclusion criteria. This was followed by detailed history and examination, the findings were recorded in a pre-designed case record Form.

A detailed history was taken with special emphasis on age of onset, total duration, duration of present episode, involvement of nail, scalp and joint and treatment of psoriasis. A detailed history was taken to evaluate the presence or absence of symptoms suggestive of: Ischemic heart disease, cerebrovascular disease, peripheral vascular disease, thyroid disease, renal disease, liver disease or diabetes mellitus. History regarding physical activity, diet, smoking (number of cigarettes/bidi per day and duration), alcohol consumption (quantity and duration) and family history were also taken from all study subjects.

General physical examination included Body mass index, Waist circumference and Waist-Hip ratio (WHR).The above parameters were graded as per September 2007 issue guidelines. Assessment of peripheral pulses and their characteristics was done. Signs suggestive of peripheral vascular compromise such as cyanosis or gangrene were noted. Systolic and Diastolic blood pressure measurement and its grading were done as per 7th report of joint national Commission.

A complete hemogram including haemoglobin, total leukocyte count (TLC), differential leukocyte count (DLC), platelet count and ESR. Blood glucose and Serum lipid profile was also done. Total serum Cholesterol was estimated by enzymatic method using Cholesterol esterase. HDL cholesterol was estimated by precipitation by phosphotungstate and magnesium. Estimation of Serum Triglycerides and Serum VLDL-cholesterol and LDL-cholesterol was also done. The values were graded as normal or abnormal in accordance with the NCEP ATP-III guidelines.

Liver function tests included estimation of serum bilirubin, SGPT, alkaline Phosphate and total protein estimation. Renal function test included estimation of blood urea, serum creatinine and serum electrolytes. C reactive protein and aso titre was also done.

The statistical analysis was done using Unpaired t-test and Chi-square test.

OBSERVATION AND RESULTS

The study was carried out to assess the association of metabolic syndrome with psoriasis by evaluating clinical and Biochemical parameters. One hundred twenty three patients attending Dermatology OPD diagnosed clinically and histopathologically to have psoriasis, fulfilling the predetermined inclusion criteria, as outlined in the material method constituted Group A. An equal number of age and sex matched patients who attended outpatient department for treatment of other benign skin disorders were taken as control (Group B).

Disease onset and course

The total duration of psoriasis ranged from 1.5 months to 16 years with mean duration 5.69±3.90 years. Most patients (47.96%) had disease duration of 0-5 years. The duration of present episode ranged from 1 month to18 months, with mean duration of 5.24±3.1 months. Depending upon the disease duration patients were categorized into 3groups: 0-5 years, 5-13years and >13 years.

Table 1: Distribution of patients as per disease duration

Disease duration (years)	No. of patients(n=123)	N (%)
0-5	59	47.96
5-13	54	43.90
>13	10	8.13

Out of 123 patients, 107 (86.99%) had history of relapse and remission. Spontaneous remission was present in 41(33.33%), while 56 patients (45.52%) attained remission following treatment.

Disease exacerbating factors

In Group A, history of Koebner's phenomenon was elicited in 47(38.21%) patients. Two patients in our series had exacerbation of disease while taking some desi medicine and one with analgesic medicine. The history of seasonal variation was present in 72 (58.54%) patients; winter exacerbation was experienced by 64 (52.03%) patients and summer exacerbation by 8(6.5%) patients; however, 51(41.46%) patients reported no seasonal change.

Joint complaints

The pain was the major complaint observed in fingers, wrist, lower back and knee joints in12, 7, 2 and 2 patients respectively. All patient tested negative for Rheumatoid (RA) factor.

History of systemic complaints

Eleven patients in Group A and four patients in Group B were found to have symptoms suggestive of abnormalities in cardiovascular system, in the form of dyspnoea on exertion and occasional chest pain (p=0.9). None of patient had any symptom suggestive of cerebrovascular of peripheral vascular compromise or any complaint pertaining to genitourinary, endocrinological or autonomic dysfunction.

Personal history

Out of 123 patients in Group A 99 (80.48%) were vegetarian, while in group B 97(78.86%) were vegetarian. Fourteen (11.38%) in Group A and nineteen (15.44%) in Group B were mild smoker; while nineteen (15.44%) in Group A and ten (8.13%) in Group B were moderate smoker. History of alcohol intake was present in twenty two patients in Group A, while thirty two patients in Group B. Alcohol intake was more than moderate in six patients in Group A and five patients in Group B. The difference between these parameters was not found statistically significant between two groups.

In Group A, 17, 86 and 20 patients were involved in mild, moderate and severe type of physical activity respectively. The corresponding value in Group B were 21, 84 and 18 respectively, the difference being statistically insignificant (p=0.760).

Table 2: Personal history, smoking & Alcohol intake

Parameters	Group A (n=123)	Group B (n=123)	P value
Vegetarian	99	97	0.7513
Smoking	33	29	0.0763
Alcohol intake	24	32	0.1458
Smoking			
Mild	14	19	0.0763
Moderate	19	10	
Non smoker	90	94	
Total	123	123	
Alcohol intake			
Mild	18	27	0.1458
Moderate	6	5	
Non alcohol	99	91	
Total	123	123	

Family history

Seven patients had psoriasis in one of their blood relative. Family history of diabetes mellitus was present in 12 patients in Group A and 16 patients in Group B, the difference being statistically insignificant. Family history of hypertension was present in 21 and 18 patients in Group A and Group B respectively. History of cardiovascular event and stroke was present in 4 and 2 patients in Group A respectively and corresponding frequency of these events was three and one patient respectively in Group B, the difference being statistically insignificant (p=1.00) between the two groups.

Table 3: Family history

Parameter	Group A(n=123)	Group A(n=123)	p- value
Diabetes mellitus	12	16	=1.00
HTN	21	18	
CAD	4	3	
Stroke	2	1	

TREATMENT HISTORY

All patients (Group A) had taken either topical or systemic treatment for their disease at some point of time.

Among the topical treatment modalities, emollient and steroid (betamethasone valerate (0.1%), clobetasol propionate (0.05%) combination with salicylic acid (3% or 6%) cream were most common and used by 62 patient. The other therapies coal tar, topical dithranol above or in combination was used in 23, 5 and 17 patients respectively. None of the patient was treated with vitamin D or retinoid.

Seventy six patients (61.78%) treated systemically, majority of them were treated with Methotrexate (39%), PUVASol (13%) followed by Ayurevedic/homeopathic medicine (9.73%). None of the case was on systemic drugs for last 6 months at time of study.

CLINICAL EXAMINATION

The most common variant being chronic plaque psoriasis (91.86%) followed by guttate psoriasis (6.5%) and Rupoid psoriasis (1.6%). None of case had flexural psoriasis and pustural psoriasis.

Table 4: Morphological Variants of psoriasis

Clinical variant	No. of patients (n=50)
Chronic plaque	113(91.86%)
Guttate	8 (6.5%)
Rupoid	2(1.6%)

PASI scoring

The disease activity and severity was assessed using Psoriasis Area Severity index (PASI).

The PASI score ranged from 3.2-23.5 with mean and median score of 11.05±3.89 and 10.9 respectively. Maximum number (57.72%) of patients had score ranging from 10-20 followed by 40.65% patients with score 0 to 10.In our study psoriasis patients were classified as mild, moderate and severe disease based upon PASI score as shown in table 5. Majority of patients had moderate disease, followed by mild and severe disease in 71(57.7%), 50(40.65%) and 2(1.62%) cases respectively.

Table 5: Distribution of disease severity among patients

PASI	Psoriasis severity	No. of patients (n=123) n (%)
0-10	Mild	50 (40.65%)
10-20	Moderate	71(57.72%)
>20	Severity	2(1.62%)

Scalp involvement

Out of 123 psoriatic patients, Scalp involvement was seen in 114 patient (92.86%).Sixty nine (56.09%) had localized involvement of scalp in the form of discrete plaques, while forty one (33.33%) had diffuse involvement; Four patients (3.25%) had pityriasis amiantacea.

Table 6: Scalp involvement in psoriatic patients

Scalp involvement	No. of patients	N (%)
Localized plaque involvement	69	56.09
Diffuse involvement	41	33.33
Pityriasis amiatancea	4	3.25
Absent	9	7.31

Nail involvement

Majority of patients had nail involvement in the form of pitting (17.88%) followed by subungual hyperkeratosis (8.13%) and onycolysis (3.25%). Least common finding was oil drop sign present in 1.62% patients. Many patients had conglomeration of nail changes in the form of pitting, subungual hyperkeratosis and onycholysis. Nails were normal in 69.10% patients.

Table 7: Nail changes in psoriasis patients

Parameters	Patients	%
Subungual hyperkeratosis	10	8.13
Pitting	22	17.88
Onycholysis	4	3.25
Oil drop sign	2	1.62
Absent	85	69.10

Psoriatic arthritis

The changes of psoriatic arthritis were observed in 5 cases; 3male and 2 female, none of them had RA factor. The onset of arthritis in these patients was in the forth-fifth decade following 7-11 years of onset of cutaneous involvement. Three patients had predominantly distal interphalangeal joint involvement, while one patient had peripheral oligoarthritis involving metacarpophalangeal and proximal interphalangeal joint: one had axial involvement in the form of sacroilitis. All patients with arthritis had nail involvement.

Table 8: Pattern of psoriatic arthritis

Type of Psoriatic Arthritis	No. of Patients(N=5)
Distal interphalangeal joint	3
Peripheral oligoarthritis	1
Sacroilitis	1

ANTHROPOMETRIC MEASUREMENTS

Body mass index (BMI)

The BMI ranged from 18.51 to 34.58 in group A with mean of 23.43±2.82, while in group B, it ranged from 17.48 to 28.35 with mean of 22.67±2.37. However the difference between two groups was statistically significant (p=0.0238).

Waist circumference.

The waist circumference ranged from 76-112 cm in male patients and from 74-114 cm in female patients amongst

Group A. Corresponding values in Group B were 67.6-94.6 cm and 64.5-95.6 cm respectively, with mean value in Group A and Group B being 84.7±6.77 and 81.78±5.50cm respectively. The difference between the two groups was statistically highly significant (p<0.001).

Waist-Hip ratio

Amongst Group A mean was 0.85±04 and in Group B 0.83±0.02, the difference between two groups was statistically highly significant (p<0.001).

Table 9: Anthropometrics parameters

Parameters	Group A	Group B	P-value
BMI	23.43±2.82	22.67±2.37	0.0238
Waist circumference	84.7±6.77	81.89±5.3	<0.001
Waist-Hip ratio	0.85±04	0.83±0.02	<0.001

Prevalence of hypertension

As shown in Table 10, in Group A 82(66.67%) patients were diagnosed to be pre-hypertensive, 17(13.82%) patients had stage-1 hypertension and 2(1.62%) had stage-2 hypertension. In Group B 90(73.17%) patients were in pre-hypertensive group, while 7(5.69%) had satge-1 hypertension. The difference was statistically insignificant between two groups (p=0.100).

Table 10: Prevalence of hypertension

BP classification	Systolic BP(mm Hg)	Diastolic BP (mm Hg)	Group A n (%)	Group B n (%)
Normal	<120	<80	22(17.88%)	26(21.14%)
Pre-HTN	120-139	80-89	82(66.67%)	90(73.17%)
Stage1 HTN	140-159	90-99	17(13.82%)	7(5.69%)
Stage 2 HTN	>160	>100	2(1.62%)	0
Total			123	123

BIOCHEMICAL EVALUATION

Blood sugar

The mean of fasting blood glucose in Group A was 92.17±26.30 mg/dl and in Group B was 84±15.70 mg/dl. The difference in fasting blood glucose between Group A and Group B was statistically significant (p=0.004).

Total serum cholesterol

The mean value of total cholesterol for Group A was 190.15±45.99 mg/dl, and in Group B was 166.94±35.88 mg/dl, the difference was statistically significant (p<0.001).Thirty three patients (26.82%) amongst Group A had hypercholesterolemia (i.e. total cholesterol ≥200 mg/dl) as compared to 16 (13%) in Group B, the difference being statistically significant (p=0.006) which is <0.05. On further evaluation fifteen patients and eighteen patients in Group A had borderline high and high total serum cholesterol respectively, while corresponding values in Group B were 5 and 11.

LDL-Cholesterol

The mean LDL-Cholesterol was 104.41±43.77 mg /dl in Group A and 89.13±24.01 mg/dl in Group B, the difference being statistically significant (p<0.001). On further evaluation, 23(18.69%) patients in group A and 5(4.06%) in Group B had abnormal (≥130 mg/dl) LDL-cholesterol levels and this difference was also statistically significant (p<0.001).

HDL-Cholesterol

The mean of serum HDL was 43.21±4.94 mg/dl in Group A and 45.77±4.36 in group B, the difference being statistically significant(p<0.001).Thirty nine (31.7%) patients in Group A and 24(19.5%) patients in Group B had low HDL-Cholesterol levels, difference being statistically significant (p<0.05).

VLDL Cholesterol

The mean for Group A and Group B were 28.58±14.27 mg/dl and that for was 19.00±9.48 mg/dl respectively, the difference being statistically significant (p<0.001).

Serum triglyceride

The mean of serum triglyceride was 127.80±63.68 mg/dl in Group A and 95.67±32.06 mg/dl in Group B. The difference being statistically significant (p<0.001).As shown in table 11, 37(16.5%) patients in Group A had abnormal (i.e. ≥150 mg/dl) triglycerides levels, as compared to Six patient in Group B. The difference was found to be statistically significant (p<0.001).

The comparison of difference parameters of lipid profile is summarized in Table 11, which revealed highly significant difference between serum total cholesterol, serum LDL serum HDL, serum VLDL and serum triglyceride between two groups.

Table 11: Comparison of lipid parameters between Group A and Group B

Parameters	Group A (n=123) mean ±S.D.	Group B (n=123) mean ±S.D.	P-value
Total cholesterol	190.15±45.99	166.94±35.88	<0.001
VLDL	28.58±14.27	19.00±9.48	<0.001

LDL	104.41±43.77	89.13±24.01	<0.001
HDL	43.21±4.94	45.77±4.36	<0.001
Triglyceride	127.80±63.68	95.67±32.06	<0.001

C-reactive protein

CRP found positive in 29 patients in Group A and 15 patients in Group B, the difference being statistically significant (p=0.015).

ASLO Titre

In our study, it is present in 22 patients in Group A and 12 patients in Group B, the difference being statistically insignificant (p=0.182).

Table 12: CRP and ASLO Titre

Parameters	Group A (n=123)	Group B (n=123)	p-value
CRP	33	15	0.015
ASLO Titer	22	12	0.182

*p<0.05- statistically significant.

Metabolic syndrome

As shown in Table 13, Group A 28(22.76%) patients had metabolic syndrome as compared to 9(7.32%) in Group B [odds ratio=3.73, p=0.0007], the difference was highly significant (p<0.001). Individual component of metabolic syndrome present in 9, 37, 63, 32 and 17 patients has WC>102cm in men or >88 cm women, Triglyceride >150mg/dl, HDL cholesterol <40 in men or <50mg/dl in women), Blood pressure (>135/85mm of Hg) and Fasting glucose (>110mg/dl) respectively in Group A. The comparative figures for Group B were 3, 6, 47, 18 and 9 patients respectively. The difference was statistically significant (p=0.018).

Table 13: Comparison of Parameters of metabolic syndrome between Group A and Group B

Parameters	Group A(n=123)	Group B(n=123)	p-value
WC>102 cm in men & >88 cm in women	9(7.32%)	3(2.44%)	
Triglycerides (>150 mg/dl)	37(30.08%)	6(4.88%)	
HDL cholesterol <40 in men or <50mg/dl in women)	63(51.22%)	47(38.21%)	0.018*
Blood pressure(>135/85mm of Hg)	32(26.02%)	18(14.63%)	
Fasting glucose(>110mg/dl)	17(13.82%)	9(7.32%)	
Metabolic syndrome	28(22.76%)	9(7.32%)	0.003

*p<0.05- statistically significant

DISCUSSION

Risk of metabolic syndrome was assessed by evaluating clinical profile (BMI, Waist circumference and W/H ratio), Lipid profile and CRP in 123 consecutive patients (Group A) diagnosed clinically and histopathologically to have psoriasis and fulfilling the predetermined inclusion criteria. An equal number of age and sex matched patients of other cutaneous diseases served as controls (Group B).

Disease exacerbating factors

The course and intensity of psoriasis is variable depending on sessions, it is more aggravated in winters. Krueger et al observed that hot weather and sunlight appear to be beneficial to the patient in terms of severity of expression of the disease whereas cold weather seemed to worsen the disease.[5] Findings in this study are also consistent with these earlier reports.

Disease course

One hundred seven (86.99%) patients had history of spontaneous or treatment induced remission. This observation reconfirms the temporary remitting and relapsing nature of this chronic disease.[3, 6]

PERSONAL HISTORY

Prevalence of smoking

In our study 33 patients (26.82%) were noted to have mild to moderate smoking index in Group A as compared to 29 patients (23.58%) in group B, the difference being statistically insignificant (p=0.0763). This finding if slight increased prevalence of smoking in psoriasis patients in our study is similar to many previous studies[7-9], although in the latter, association between heavy smoking and psoriasis was statistically significant.

Prevalence of alcohol intake

Our study revealed higher prevalence of alcohol intake in Group B (26.82%) as compared to Group A (19.51%) but the difference was statistically insignificant (p=0.1458). Similarly to our study Naldi et al observed no significant association with alcohol consumption after controlling for smoking habits.[10]

Dietary practice

There was no significant difference between psoriasis patients and controls with respect to dietary habits. Further, no association was found between dietary intake, hyperlipidemia and severity of psoriasis.

Family history

Family history of psoriasis was present in seven (5.69%) patient. Bedi et al reported positive family history of psoriasis in 14% of their patients. A study by Kaur et al comprising of 1220 outpatient in which they found a positive family history in only 2% of patients.[11] Our study was accordance with various western studies in which the familial incidence varied from 4.6% to 6.4%.[12-13]

CLINICAL EXAMINATION

Morphological variants

The chronic plaque psoriasis was the most common variant observed in 91.86% followed by guttate psoriasis (6.5%). It was in accordance with the study by Gisondi et al who reported chronic plaque psoriasis as the most common clinical type in 96.3% of cases.[4]

PASI

In our study, PASI score ranged from 5-42 with a mean score of 11.05 + 3.89 and a median score of 10.9.In a hospital based case-control study by Gisondi et al, PASI score ranged from 1.3 to 60.2, with a median score of 7.9, however this study differs from ours in view of large sample size (n=338).[4]

Scalp involvement

Out of 123 psoriatic patients, scalp involvement was seen in 114 (92.86%) in our study. It is slightly higher than 50-80% scalp involvement with psoriasis documented in other studies.[14-15]

Nail involvement

Nail changes including nail pits, onycholsis, subungual hyperkeratosos, oil drop sign etc. were observed in 38 (31.9%) patients with finger nails predominance. Nail involvement was found to be higher in our study as compared to previous studies where prevalence of nail changes reported in 11 to 50% in other studies of psoriasis patients.[16-17] In our study the most common nail finding was pitting, reported in 22(17.88%) patients followed by subungual hyperkeratosis and onycholysis present in 10 and 4 patients respectively.

Psoriatic arthritis

In our study five patients (4.06%) had psoriatic arthritis, which is lower than the previously reported prevalence of 11% to 30%.[18-19] Three patients had predominantly distal interphalangeal joint involvement, while one patient had peripheral oligoarthritis involving metacarpophalangeal and proximal interphalangeal joint; one had axial involvement in the form of sacroilitis. In a study by Mazlan et al polyarticular pattern of psoriatic arthritis was most common (52.2%), followed by oligoarticular involvement in (34.3%) of patients, however this study included large number of patients with psoriatic arthritis.[20]

ANTHROPOMETRIC MEASUREMENTS

Body mass index (BMI)

In our study, mean BMI in Group A was found to be 23.43 $\pm$ 2.82 and that in Group B was 22.67$\pm$ 2.37, the difference being significant (p=0.0238). Where as in the study of Gisondi et al, the mean BMI in psoriasis patients was 26.9 $\pm$ 4.2 versus 26.4 $\pm$ 3.2 in controls (p=0.68)[4] and had not demonstrated correlation between two parameters. However in a study of 17388 psoriatic patients, Herron et al documented BMI to be significantly higher in patients as compared to control[7].

Waist circumference

Our study revealed waist circumference values ranging from 76-112 cm in male patient and 74-114 cm in female patient amongst Group A, while the corresponding figures were 67.6-94.6 cm and 64.5-95.6 cm respectively in Group B. The mean values in Group A and Group B was 84.7 $\pm$ 6.77 and 81.78 $\pm$ 5.50cm respectively and the difference between the two groups was found to be significant (p<0.001). Our findings support the study of Gisondi et al in which significantly higher waist-circumference reported among psoriatic patients as compared to control.[4] Waist-hip ratio.

The mean waist-hip ratio for Group A was 0.85 $\pm$ 0.04 and in Group B was 0.83$\pm$ 0.02, difference between two groups being highly significant (p<0.001). In coherence with our observation, Soy et al have also reported significantly higher waist-hip ratio in psoriatic patients as compared to controls. However, this study was done on patients with psoriatic arthritis only.[21] Balci et al documented higher waist hip ratio among psoriasis patients, though it was statistically insignificant (p=0.278).[22]

Prevalence of hypertension

In our study 101 patient (82.11%) in Group A were found to be hypertensive, as compared to 97 patients (78.86%) in Group B and the difference was statistically insignificant (p=0.100). Inerot et al also could not found any increase in frequency of hypertension in psoriatic patients sampled from general population.[23]

Biochemical investigations

Blood sugar

The mean fasting blood glucose in Group A and Group B was 92.17±26.30 mg/dl and 84±15.70 mg/dl respectively. Our findings are in accordance with the study of Sekin et al in which they documented significantly raised fasting blood glucose in psoriatic patients compared to control ($p \leq 0.05$).[24]

Serum lipid profile

Total cholesterol

The mean values of total cholesterol in Group A and Group B was 190.15±45.99 mg/dl and 166.94±35.88 mg/dl respectively, the difference being highly

significant (p =<0.001). Dreiher et al in their study observed significantly higher total cholesterol levels (200.3 ± 38.7) mg/dl versus 196.9 ± 40.1 mg/dl, p=0.001) as compared to controls.[25]

Low-density cholesterol (LDL-C)
The mean values of LDL – Cholesterol was 104.41±43.77 mg/dl and 89.13±24.01 mg/dl Group A and B respectively, the difference being statistically significant (p<0.001).

The result of our study are supported by the studies of Rocha-pereira, Tekin and Piskin el al, in which they found out significantly raised LDL-cholesterol levels in psoriatic patients as compared to control.[26-28]

High density lipoprotein Cholesterol (HDL-C)
In our study, the mean values of serum HDL were observed to be 43.21±4.94 mg/dl in Group A and 45.77±4.36 mg/dl in Group B; the difference being statistically significant (p value<0.001).

Results of our study correlate with the population based study comprising of 10,669 psoriasis patients and 22,996 controls by Dreiher et al in which they reported lower mean serum HDL values 9 48.16 ± 8.71 mg/dl versus 56.77 ± 12.38 mg/dl, p < 0.001).[25] These results persisted even after controlling for confounders.

Very low density lipoprotein (VLDL-C)
The mean value for Group A and Group B was 28.58±14.27 mg/dl and 19.00±9.48 mg/dl respectively, the difference was statistically (p<0.001). The finding of our study are in accordance with the Rocha-pereira et al, in they reported serum VLDL-C levels 24.0 ± 9.9 mg/dl in psoriatic patients and 18.6 ± 6.3 mg/dl in age and sex matched controls (p<0.01).[26]

Serum triglycerides
In our study, the mean value of serum triglyceride in Group A and Group B were 127.80±63.68 mg/dl and 95.67±32.06 mg/dl respectively; the difference being statistically significant (p<0.001).

The finding of our study are in agreement with the recent study from Pakistan conducted on 50 psoriatic patients demonstrating significantly raised serum triglycerides levels as compared to control (p<0.01).[29]

C - reactive protein
In our study the CRP positive in 33 patients in Group A and 15 patients in Group B, the difference was statistically significant (p= 0.015). Many studies have also reported CRP levels to be elevated in psoriatic patients.[30, 31]

ASLO Titre
In our study the ASLO Titre was positive in 22 patients in Group A and 12 patients in Group B, the difference was statistically insignificant(p=0.182). Qazi Masood et al studies 104 patients of acute guttate psoriasis, they reported positive ASLO titre in significant no of cases 46.2%.

Metabolic syndrome
Our study observed high prevalence of metabolic syndrome in psoriatic patient than control [28(22.76%) v/s 9(7.32%) odds ratio=3.73, p=0.0007] which is similar to cross-sectional study by Gisondi et al [30.1% vs. 20.6%, OR 1.65, P=0.005].[4] Furthermore, Sommer et al. also found higher prevalence of metabolic syndrome among hospitalized psoriatic patients as compared to hospitalized melanoma patients but the study instead of ATP III criteria adopts a modified version of the WHO definition of metabolic syndrome.[32]

This study is a pioneer in the evaluation of the metabolic syndrome in psoriatic patients by assaying anthropometric parameters, lipid profile and CRP in resource poor setup. We concluded that there is significant dyslipidemia, obesity and raised CRP in psoriasis patients as compared to control population. It gives a clue regarding inherent risk of metabolic syndrome in psoriatic patients. Hence these patients should not only be evaluated for psoriasis but also for possibilities of metabolic syndrome.

SUMMARY AND CONCLUSION

In both groups ranged from 18 to 60 years with mean age of presentation was 33.78±9.12 years and 33.38±8.67 in psoriatic and control group respectively. The total duration of psoriasis ranged from 1.5 months to 16 years with mean duration 5.69±3.90 years.

The seasonal variations experienced by 92 (74.79%) patients; majority had winter exacerbation (52.03%) few cases experienced (6.5%) summer exacerbation.

Koebner's phenomenon elicited in forty seven patients (38.21%) and two patients had exacerbation of disease while taking some desimedicine and one patient with analgesic medicine.

Joint involvement observed in 23 (18.70%) psoriasis patients.

Slightly higher prevalence of smoking and alcohol was observed among study group as compared to control, although difference was statistically insignificant.

All patients had history of either topical or systemic treatment for the disease. Seventy six patients (61.78%) received systemic treatment at one or more time during the course of psoriasis.

The chronic plaque psoriasis was the most common morphological variant observed in 91.86% patients. Scalp and nails were involved in 92.86% and 30.9% cases respectively.

PASI score ranged from 3.2-23.5 with mean score of 11.05±3.89. Majority of patients had (98.38%) mild to moderate disease.

Psoriatic arthritis observed in five patients affecting distal interphalangeal, metacarpophalangeal, proximal interphalangeal and sacroiliac joints.

No significant difference was observed in the prevalence of hypertension in Group A as compared to Group B. Blood fasting sugar was significantly raised in group A as compared to Group B, though most of figures were below diabetic range.

On comparison of anthropometric parameters, BMI, waist circumference and waist-hip ratio were significantly higher in Group A, compared to Group B.

On comparison of lipid profiles, the incidence of dyslipidemia was found to be significantly higher in Group A as compared to Group B, with all the components of lipid profile being significantly raised in Group A.

Total cholesterol levels were abnormal (≥200 mg/dl) in significantly higher number of patients in Group A (26.82%) as compared to Group B (13%).

Levels of LDL-Cholesterol were abnormal (≥130mg/dl) in significantly higher number of patients in Group A (18.69%) as compared to Group B (4.06%).

Serum triglycerides were abnormal (≥150mg/dl) in significantly higher number of patients in Group A (16.50%) as compared to Group B (4.88%).

CRP was significantly raised in Group A as compared to Group B.

High prevalence of metabolic syndrome in psoriatic patient than control [28(22.76%) v/s 9(7.32%) odds ratio=3.73, p=0.0007].

In present study we evaluated the prevalence of metabolic syndrome in psoriatic patients by assaying anthropometric parameters, lipid profile and CRP. We concluded that there is significant dyslipidemia, obesity and raised CRP in psoriasis patients as compared to control population. It gives an early clue regarding possible and inherent risk of metabolic syndrome in these patients. These patients should be regularly monitored not only for psoriasis but also for metabolic syndrome.

REFERENCES

1. 1Griffith CEM, Camp RDR, Barker JNWN. Burns T, Breathnach S, Cox N, Griffith CEM, editors. Psoriasis in Rook's Text Book of Dermatology.8th edition. Wiley, Blackwell science, 2010; 20.1.
2. 2Convit J. Investigation of the incidence of psoriasis among Latin American Indians. In: *Proceedings of the XIIth Congress on Dermatology*. Amsterdam: Exerpta Medica, 1962; 196.
3. 3Henseler T, Chritstophers E. Psoriasis of early and late onset: Characterization of two type of psoriasis vulgaris. J Am Acad Dermatol, 1985; 13: 450-6.
4. 4Gisondi P, Tessari G, Conti A, et al. Prevalence of metabolic syndrome in patients with psoriasis: a hospital-based case-control study. Br J Dermatol, 2007; 157: 68-73.
5. 72Kruger GG. Psoriasis: Current concepts of etiology and pathologenesis. In: Dobson RL, Theirs BH, ed. Year Book of Dermatology. Chicago: McGraw Hill Publishers, 1981; 13-22.
6. 73Langley RG, Krueger GG, Griffith's CE. Psoriasis: epidemiology, clinical features, and quality of life. Ann Rheum Dis., 2005; 64: 18-23.
7. 76Herron MD, Hinnckley M, Hoffman MS, Papenfuss J, Hansen CB, Callis KP, et al. Impact of obesity and smoking on psoriasis presentation and management. Arch Dermatol, 2005; 141: 1527-34.
8. 77Naldi L, Mercuri SR. Smoking and psoriasis: from epidemiology to pathomechanisms. J Invest Dermatol, 2009; 129: 2741-3.
9. 78Gerdes S, Zahl VA, Weichenthal M, Mrowietz U. Smoking and acohol intae in severely affected patients with psoriasis in Germany. Dermatology, 2010; 220: 38-43.
10. 79Naldi L, Peli L, Parazzini F. Association of early-stage psoriasis with smoking and male alcohol consumption: evidence from an Italian case-control study. Arch Dermatol, 1999; 135: 1479-84.
11. 81Kaur I, Handa S, Kumar B. Natural history of psoriasis: a study from the Indian subcontinent. J Dermatol, 1997; 24: 230-4.
12. 6Hellgren L. Psoriasis the prevalence of sex, age and occupational groups in total population in Sweden. Morphology, Inheritance and association with other skin and reheumatic disease. Stockholm: Almqvist & Wiksell., 1967; 134-45.
13. 69Farber EM, Bright RD, Nall ML. The nature history of psoriasis in 5600 patients. Dermatologica, 1974; 148: 1-18.
14. 74Christophers E. Psoriasis-epidemiology and clinical spectrum. Clin Exp Dermatol, 2001; 26: 314-20.
15. 87Sola-Ortigosa J, Sanchez-Regana M, Umbert-Millet P. An update on scalp psoriasis. Acta Dermosifiliogr, 2009; 100: 536-43.
16. 37Farber EM, Nall L. Nail psoriasis. Cutis, 1992; 50: 174-8.
17. 88Del Rosso JQ. dermatologic diseases of the nail unit. In: scher RK, Daniel CR, eds. Nails: Therapy,

Diagnosis, Surgery. Philadelphia: WB saunders, 1997; 172.
18. 89Mease P. Psoriatic arthritis update. Bull NYU Hosp Jt Dis., 2006; 64(1-2): 25-31.
19. 90Gelfand JM, Galdman DD, Mease PJ. Epidemiology of psoriatic arthritis in the population of united states. J Am Acad Dermatol, 2005; 53: 573.
20. 91Lomholt G. Psoriasis: Prevalence, spontaneous course and genetics, in Published Ph.D Thesis, edited by Lomholt G. Copenhagen, GEC GAD, 1963.
21. 94Soy M, Yildiz M, Sevi Uyanik M, Karaca N, Güfer G, Piskin S. susceptibility to artherosclerosis in patients with psoriasis and psoriatic arthritis as determined by carotid-femoral (aortic) pulse-wave velocity measurement. Rev Esp Cardiol, 2009; 62: 96-9.
22. 92Balci D, Balci A, Karazincir S, Ucar E, lygium F, et al. Increased carotid artery intima-media and impaired endothelial function in psoriasis. J Eur Acad Dermatol Venereol, 2008, 23: 1-16.
23. 95Inerot A, Enerback C, Enlund F, Martinsson T, Samuelsson L, Wahlstrom J, et al. Collecting a set of psoriasis family material through a patient organization; clinical characterization and presence of additional disordes. BMC Dermatol, 2005; 5: 10.
24. 97Seckin D, Tokgozoglu L, Akkaya S. Are lipoprotein profile and lipoprotein levels altered in men with psoriasis? J Am Acad Dermatol, 1994; 31: 445-9.
25. 65Dreiher J, Weitzman D, Davidovici B, Shapiro J, Cohen AD. Psoriasis and dyslipidaemia: a population-based study. Acta Derm Venereol., 2008; 88(6): 561-5.
26. 100Rocha-Pereira P, Santos-Silva S, Rebelo l, Figueredo A, Quintanilha A, Teixeriab F. Dyslipidemia and oxidative stress in mild and in severe psoriasis as a risk factor for cardiovascular disease. Clin Chim Acta, 2001; 303: 33-9.
27. 101Tekin NS. Tekin IO, Barut F, Sipahi EY. Accumulation of oxidized low-density lipoprotein in psoriatic skin and changes of plasma lipid levels in psoriatic patients. Mediators inflamm, 2007; 78454.
28. 102Piskin S, Gurkork F, Ekuklu G, Senol M. Serum lipid levels in psoriasis. Yonsei Med J, 2003; 44: 24-6.
29. 85Bajaj DR, Mahesar SM, Devrajani BR, Iqbal MP. Lipid profile in patients with psoriasis presenting at Liaquat University Hopital Hyderabad. Pak Med Assoc, 2009; 59: 512-5.
30. 104Rocha-Pereira P, Santos-Silva S, Rebelo l, figueiredo A, Quintanilha A, et al. The inflammatory response in mild and in severe psoriasis. Br J Dermatol, 2004; 150: 917-28.
31. 105Ctirad A, Lenka B, David P, Zdenek F, Kveta H, Karel E, et al. Goeckerman's therapy for psoriasis with special reference to serum pentraxin 3 level. Int J Dermatol, 2008; 47: 1011-4.
32. 66Sommer DM, Jenisch S, Suchan M, Christophers E, Weichental M. Increased prevalence of metabolic syndrome in patients with moderate to severe psoriasis. Arch Dermatol Res., 2006; 298: 321-8.